

### REMARKS/ARGUMENTS

Claims 1 – 20 are presented for reconsideration and further examination in view of the foregoing amendments and the following remarks.

In the outstanding Office Action, the Examiner rejected claims 1 – 20 under 35 U.S.C. §112, first paragraph; rejected claims 1 – 6, 9, 11, 12 and 14 – 18 under 35 U.S.C. §103(a) as being unpatentable over reference no. WO 99/16380 to Taub et al. (hereinafter referred to as “the Taub et al. ‘380 reference”) in view of U.S. Patent No. 6,152,731 to Jordan et al. (hereinafter referred to as “the Jordan et al. ‘731 patent”) and U.S. Patent No. 4,850,864 to Diamond (hereinafter referred to as “the Diamond ‘864 patent”); rejected claims 7 and 13 under 35 U.S.C. §103(a) as being unpatentable over the Taub et al. ‘380 reference in view of the Jordan et al. ‘731 patent and the Diamond ‘864 patent and further in view of U.S. Patent No. 6,413,083 to Hamilton (hereinafter referred to as “the Hamilton ‘083 patent”); rejected claims 8 and 10 under 35 U.S.C. §103(a) as being unpatentable over the Taub et al. ‘380 reference in view of the Jordan et al. ‘731 patent and the Diamond ‘864 patent and further in view of U.S. Patent No. 6,227,850 to Chishti et al. (hereinafter referred to as “the Chishti et al. ‘850 patent”); rejected claim 19 under 35 U.S.C. §103(a) as being unpatentable over the Taub et al. ‘380 reference in view of the Jordan et al. ‘731 patent and the Diamond ‘864 patent and further in view of U.S. Patent No. 6,350,120 to Sachdeva et al. (hereinafter referred to as “the Sachdeva et al. ‘120 patent”); and rejected claim 20 as being unpatentable over the Taub ‘380 reference in view of the Jordan et al. ‘731 patent and the Sachdeva et al. ‘120 patent.

By this Response and Amendment, claims 1, 6, 11, 18 and 20, have been amended and, as amended, the rejections thereto and the rejections to the claims dependent thereon have been traversed. Support for the amendments to the independent claims can be found on page 8, lines 3 – 20 and in figs 2

– 4 and 6 of the originally filed specification. Therefore, Applicants submit that the no new matter, within the meaning of 35 U.S.C. §132, has been introduced to the application.

### **Rejections Under 35 U.S.C. §112, First Paragraph**

The Examiner rejected claims 1 – 20 as containing new matter. Specifically, the Examiner notes that the phrases “discontinuing obtaining of said virtual representation and discontinuing processing of said virtual representation;” “after said discontinuing obtaining of said virtual representation and said discontinuing processing of said virtual representation;” and “while placing one or more real brackets directly on corresponding one or more teeth of said individual” are not found in the original specification.

### **Response**

By this Response and Amendment, the phrases “discontinuing obtaining of said virtual representation and discontinuing processing of said virtual representation” and “after said discontinuing obtaining of said virtual representation and said discontinuing processing of said virtual representation” have been removed from claims 1, 11 and 18. With respect to the phrase “while placing one or more real brackets directly on corresponding one or more teeth of said individual,” support can be found on page 4, lines 1 – 14 of the originally filed specification.

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejection under 35 U.S.C. §112, first paragraph.

### **Rejections Under 35 U.S.C. §103(a)**

To establish a *prima facie* case of obviousness, the Examiner must establish: (1) some suggestion or motivation to modify the references exists; (2) a reasonable expectation of success; and (3) the prior art references teach or suggest all of the claim limitations. *Amgen, Inc. v. Chugai Pharm. Co.*, 18 USPQ2d 1016, 1023 (Fed. Cir. 1991); *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); *In re Wilson*, 165 USPQ 494, 496 (CCPA 1970).

#### **1. The Taub et al. '380 Reference In View Of The Jordan et al. '731 Patent and The Diamond '864 Patent**

The Examiner rejected claims 1 – 6, 9, 11, 12 and 14 – 18 as being unpatentable over the Taub et al. '380 reference in view of the Jordan et al. '731 patent and the Diamond '864 patent.

### **Response**

By this Response and Amendment, Applicants respectfully traverse the Examiner's rejection, since the combination of prior art references does not disclose, teach or suggest all of the features of the independent claims of the present application.

Independent claims 1, 11, 18 and 20 similarly recite "...driving a display to display an exclusively virtual image of at least one tooth with a bracket thereon...."

The Taub et al. '380 reference discloses a device for providing guidance information for an intended position of a real orthodontic element on a tooth's surface and simultaneously positioning the element on the tooth's surface according to the intended position. The device requires the use of a positioning device 20 for placing a bracket on a tooth. The bracket 20 includes a camera 26 (or other imaging device) mounted on a mount. The Jordan et al. '731 patent discloses a method of

creating a three-dimensional dental model. The Diamond '864 patent discloses a bracket placing instrument usable with a computer that displays a real image of a tooth. The instrument is held by a dentist and used to apply a bracket on a tooth using the real image displayed on the computer.

In contrast to the presently claimed invention, the cited prior art combination Taub et al. '380 reference with the Jordan et al. '731 patent does not disclose teach or suggest "driving a display to display an *exclusively* virtual image of at least one tooth with a bracket thereon" as recited in amended independent claim 1 and as similarly recited in independent claims 11, 18 and 20. Both the tooth and the bracket that are displayed in the display of the presently claimed invention are virtual. However, the combination of the Taub et al. '380 reference with the Jordan '731 patent teaches against "driving a display to display an *exclusively* virtual image of at least one tooth with a bracket thereon..." as recited in the independent claims of the present application. In the Taub et al. '380 reference, a composite image is used, which incorporates a real (and real-time video-) image of the tooth onto which the brackets to be placed.

Moreover, the cited prior art combination does not disclose, teach or suggest that the displayed image has "three-dimensional qualities indicative of said at least one tooth as viewed from a defined viewpoint" as in the presently claimed invention. There is no disclosure, teaching or suggestion in the Taub '380 patent for the virtual image part of the composite image having 3D qualities, and in fact such a virtual image component may actually make it more difficult to match the real image with the virtual image components. Therefore, the cited prior art combination does not teach the presently claimed invention and does not render the claims obvious.

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the outstanding rejection under 35 U.S.C. §103(a).

**2. The Taub et al. '380 Reference In View Of The Jordan et al. '731 Patent And The Diamond '864 Patent And Further In View Of The Hamilton '083 Patent**

The Examiner rejected claims 7 and 13 under 35 U.S.C. §103(a) as being unpatentable over the Taub et al. '380 reference in view of the Jordan et al. '731 patent and the Diamond '864 patent and further in view of the Hamilton '083 patent.

**Response**

By this Response and Amendment, Applicants respectfully traverse the Examiner's rejection, since all of the features of the presently claimed invention are not disclosed, taught or suggested by the cited prior art. The arguments above with respect to the Taub et al. '380 reference, the Jordan et al. '731 patent, and the Diamond '864 patent are incorporated herein by reference.

Adding the Hamilton '731 patent to the combination of the Taub et al. '380 reference, Jordan et al. '731 patent, and the Diamond '864 patent does not cure the deficiencies of the cited prior art combination. The Hamilton '083 patent discloses a computerized system for diagnosing a tooth-size discrepancy and recommending an ideal arch size based on the size of an individual patient's teeth. The Hamilton '731 patent is silent as to "driving a display to display an *exclusively* virtual image of at least one tooth with a bracket thereon, the displayed image having three-dimensional qualities indicative of said at least one tooth as viewed from a defined viewpoint." As such, the addition of the Hamilton '731 patent to the combination of the Taub et al. '380 reference with the Jordan et al. '731 patent still does not teach the presently claimed invention and therefore does not render the presently claimed invention obvious.

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the

outstanding rejection under 35 U.S.C. §103(a).

**3. The Taub et al. '380 reference In View Of The Jordan et al. '731 Patent And The Diamond '864 Patent And Further In View Of The Chishti et al. '850 Patent**

The Examiner rejected claims 8 and 10 as being unpatentable over the Taub et al. '380 reference in view of the Jordan et al. '731 patent and the Diamond '864 patent and further in view of the Chishti et al. '850 patent.

**Response**

By this Response and Amendment, Applicants respectfully traverse the Examiner's rejection, since all of the features of the presently claimed invention are not disclosed, taught or suggested by the cited prior art. The arguments above with respect to the Taub et al. '380 reference, the Jordan et al. '731 patent, and the Diamond '864 patent are incorporated herein by reference.

Adding the Chishti et al. '850 patent to the combination of the Taub et al. '380 reference and Jordan et al. '731 patent does not cure the deficiencies of the cited combination. The Chishti et al. '850 patent discloses a system that captures three-dimensional (3D) data associated with a patient's teeth, determines a viewpoint for the patient's teeth, applies a positional transformation to the 3D data based on the viewpoint, and renders the orthodontic view of the patient's teeth based on the positional transformation. However, the Chishti et al. '850 patent is silent as to "driving a display to display an *exclusively* virtual image of at least one tooth with a bracket thereon, the displayed image having three-dimensional qualities indicative of said at least one tooth as viewed from a defined viewpoint" As such, the addition of the Chishti et al. '850 patent to the combination of the Taub et al. '380 reference with the Jordan et al. '731 patent still does not teach the presently claimed

invention and therefore does not render the presently claimed invention obvious.

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the outstanding rejection under 35 U.S.C. §103(a).

**4. The Taub et al. '380 reference In View Of The Jordan et al. '731 Patent And The Diamond '864 Patent And Further In View Of The Sachdeva et al. '120 Patent**

The Examiner rejected claim 19 as being unpatentable over the Taub et al. '380 reference in view of the Jordan et al. '731 patent and the Diamond '864 patent and further in view of the Sachdeva et al. '120 patent.

**Response**

By this Response and Amendment, Applicants respectfully traverse the Examiner's rejection, since all of the features of the presently claimed invention are not disclosed, taught or suggested by the cited prior art. The arguments above with respect to the Taub et al. '380 reference, the Jordan et al. '731 patent, and the Diamond '864 patent are incorporated herein by reference.

Adding the Sachdeva et al. '120 patent to the combination of the Taub et al. '380 reference, Jordan et al. '731 patent and the Diamond '864 patent does not cure the deficiencies of the cited prior art combination. The Sachdeva et al. '120 patent discloses using a three-dimensional digital model of an orthodontic structure to develop a custom jig for installing an orthodontic bracket. However, the Sachdeva et al. '120 patent is silent as to "driving a display to display an *exclusively* virtual image of at least one tooth with a bracket thereon, the displayed image having three-dimensional qualities indicative of said at least one tooth as viewed from a defined viewpoint." As such, the addition of the Sachdeva et al. '120 patent to the combination of the Taub et al. '380

reference with the Jordan et al. '731 patent still does not teach the presently claimed invention and therefore does not render the presently claimed invention obvious.

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the outstanding rejection under 35 U.S.C. §103(a).

**5. The Taub et al. '380 reference In View Of The Jordan et al. '731 Patent And Further In View Of The Sachdeva et al. '120 Patent**

The Examiner rejected claim 20 as being unpatentable over the Taub et al. '380 reference in view of the Jordan et al. '731 patent and further in view of the Sachdeva et al. '120 patent.

**Response**

By this Response and Amendment, Applicants respectfully traverse the Examiner's rejection, since all of the features of the presently claimed invention are not disclosed, taught or suggested by the cited prior art. The arguments above with respect to the Taub et al. '380 reference, the Jordan et al. '731 patent, and the Sachdeva et al. '120 patent are incorporated herein by reference.

Independent claim 20 recites "...driving a display to display an exclusively virtual image of at least one tooth with a bracket thereon...."

The Taub et al. '380 reference discloses a device for providing guidance information for an intended position of a real orthodontic element on a tooth's surface and simultaneously positioning the element on the tooth's surface according to the intended position. The device requires the use of a positioning device 20 for placing a bracket on a tooth. The bracket 20 includes a camera 26 (or other imaging device) mounted on a mount. The Jordan et al. '731 patent discloses a method of creating a three-dimensional dental model. The Diamond '864 patent discloses a bracket placing



instrument usable with a computer that displays a real image of a tooth. The instrument is held by a dentist and used to apply a bracket on a tooth using the real image displayed on the computer.

In contrast to the presently claimed invention, the cited prior art combination Taub et al. '380 reference with the Jordan et al. '731 patent does not disclose teach or suggest "driving a display to display an *exclusively* virtual image of at least one tooth with a bracket thereon" as recited in amended independent claim 20. Both the tooth and the bracket that are displayed in the display of the presently claimed invention are virtual. However, the combination of the Taub et al. '380 reference with the Jordan '731 patent teaches against "driving a display to display an *exclusively* virtual image of at least one tooth with a bracket thereon..." as recited in the independent claims of the present application. In the Taub et al. '380 reference, a composite image is used, which incorporates a real (and real-time video-) image of the tooth onto which the brackets to be placed.

Moreover, the cited prior art combination does not disclose, teach or suggest that the displayed image has "three-dimensional qualities indicative of said at least one tooth as viewed from a defined viewpoint" as in the presently claimed invention. There is no disclosure, teaching or suggestion in the Taub '380 patent for the virtual image part of the composite image having 3D qualities, and in fact such a virtual image component may actually make it more difficult to match the real image with the virtual image components. Therefore, the cited prior art combination does not teach the presently claimed invention and does not render the claims obvious.

Adding the Sachdeva et al. '120 patent to the combination of the Taub et al. '380 reference and the Jordan et al. '731 patent does not cure the deficiencies of the cited prior art combination. The Sachdeva et al. '120 patent is silent as to "driving a display to display an *exclusively* virtual image of at least one tooth with a bracket thereon, the displayed image having three-dimensional

qualities indicative of said at least one tooth as viewed from a defined viewpoint.” As such, the addition of the Sachdeva et al. ‘120 patent to the combination of the Taub et al. ‘380 reference with the Jordan et al. ‘731 patent still does not teach the presently claimed invention and therefore does not render the presently claimed invention obvious.

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the outstanding rejection under 35 U.S.C. §103(a).

### CONCLUSION

In light of the foregoing, Applicants submit that the application is now in condition for allowance. If the Examiner believes the application is not in condition for allowance, Applicants respectfully request that the Examiner contact the undersigned attorney if it is believed that such contact will expedite the prosecution of the application.

In the event this paper is not timely filed, Applicants petition for an appropriate extension of time. Please charge any fee deficiency or credit any overpayment to Deposit Account No. 14-0112.

Respectfully submitted,  
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